BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF DELAWARE

IN THE MATTER OF INTEGRATED RESOURCE PLANNING FOR THE PROVISION OF STANDARD OFFER SUPPLY SERVICE BY DELMARVA POWER & LIGHT COMPANY UNDER 26 DEL. C. § 1007(c) & (d): REVIEW OF INITIAL RESOURCE PLAN SUBMITTED DECEMBER 1, 2006 (OPENED JANUARY 23, 2007)	)	PSC DOCKET NO. 07-20

Initial IRP Comments of Jeremy Firestone on Draft IRP

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A. General Comments

1. The Commission Has the Duty to Review, Modify and Approve the IRP.

In PSC Order No. 7122, the Commission sought views regarding the scope of its review of the IRP. In pertinent part, HB6 directs that:

> "DP&L is required to conduct integrated resource planning."
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> "DP&L shall systematically evaluate all available supply options during a 10-year planning period in order to acquire sufficient, efficient and reliable resources over time to meet its customers' needs at a minimal cost."
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> "The IRP shall set forth DP&L's supply and demand forecast for the next 10-year period, and shall set forth the resource mix …"
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> "DP&L shall not rely exclusively on any particular resource or purchase procurement process."

> "DP&L shall explore in detail all reasonable short- and long-term procurement or demand-side management strategies, even if a particular strategy is ultimately not recommended by the company."
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> "At least 30 percent of the resource mix of DP&L shall be purchases made through the regional wholesale market via a bid procurement or auction process … overseen by the Commission…."
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> "The IRP must investigate all potential opportunities for a more diverse supply at the lowest reasonable cost."
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> As part of the initial IRP process, to immediately attempt to stabilize the long-term outlook for standard offer supply in the DP&L service territory, DP&L shall file on or before August 1, 2006, a proposal to obtain long-term contracts. … The Commission, the Director of the Office of Management and Budget, the Controller General and the Energy Office shall, on or before February 28, 2007, evaluate such proposals and may determine to approve 1 or more of such proposals that result in the greatest long-term system benefits, including those identified in paragraph (1) of this subsection, in the most cost-effective manner.
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> "The Commission shall have the authority to promulgate any rules and regulations it deems necessary to accomplish the development of IRPs by DP&L."

(Emphasis added). First, given the consistent use of the mandatory command "shall," it is apparent, the Commission must ensure that Delmarva in fact "systematically evaluates" and "explores in detail" supply and demand-side options. Second, given that the Legislature explicitly granted the Commission rulemaking authority regarding the IRP, the Commission at a minimum has the authority to "investigate and evaluate the substantive end-results" of Delmarva's analysis. The question is must it so investigate? A review of the statute as a whole leads to the conclusion that it must.

In light of the fact that the four state agencies have explicit authority to approve or disapprove any of the RFP proposals and that the Commission previously determined that the RFP needs to "appropriately reflect[] the overall IRP goals" (PSC Order 7066, ¶¶ 17 and 39), it is apparent that the Commission must "investigate and evaluate the substantive end-results" and

ultimately approve the IRP. Otherwise, the Commission, and the other three state agencies, would be put in the position of making decisions based on findings and determinations of a party—Delmarva—that the Commission regulates. Indeed, such a contrary finding would turn the respective roles of the regulator and the regulatee upside down. Further, as noted above, the Legislature provided the Delmarva "shall explore in detail all reasonable short- and long-term procurement or demand-side management strategies, even if a particular strategy is ultimately not recommended by the company." The use of the word "recommended" indicates that the Legislature viewed Delmarva as only making recommendations in its IRP, recommendations that would be subject to substantive review, modification, and approval by the Commission.

This view is also consistent with the grant of jurisdiction to the Commission over public utilities, wherein the Commission was given "original exclusive jurisdiction and regulation of all public utilities and also over their rates, property rights, equipment, facilities, service territories and franchises so far as may be necessary for the purpose of carrying out the provisions of this title [26]." 26 Del. C. §201.

2. Delmarva Power's Draft IRP Fails to Meet the Mandatory Direction of the Legislature in § 1007(c) and Dismisses the RFP out of Hand.

HB6 provides in pertinent part that:

- Delmarva "shall ***systematically evaluate*** all available supply options" during a 10-year planning period in order to acquire sufficient, efficient and reliable resources over time to meet its customers' needs at a minimal cost."
- Delmarva "shall ***explore in detail*** all reasonable short- and long-term procurement or demand-side management strategies, even if a particular strategy is ultimately not recommended by the company."
- Delmarva "***must investigate*** all potential opportunities for a more diverse supply at the lowest reasonable cost."

(Emphasis added). Delmarva states that it "believes that the SOS procurement process should: Balance reductions in price volatility with the absolute level of prices." IRP Report, p. 22. Delmarva has, unfortunately, ignored its own advice to provide balance and crafted a fundamentally flawed IRP that fails to implement the legislative mandate as specified in HB6. While it is certainly understandable that Delmarva could not have evaluated the precise proposals submitted as part of the RFP process, it, like the rest of us who participated in the process, had a good idea of what the proposals were likely to look like. Consequently, Delmarva could have and should have "investigated, evaluated "systematically," and "explored in detail" the potential option of long-term supply.

Instead of approaching the possibility of entering into long-term contracts with its eyes wide open, as it should have in the IRP, Delmarva approached that possibility with blinders on. Indeed, it appears that Delmarva undertook the IRP not as an objective broker, but rather, with an agenda that at its core is centered on Delmarva's desire not to enter into long-term contracts.

Delmarva rightly raises the issue of customer choice as a concern with long-term contracts, yet uses that expressed concern inappropriately to dismiss long-term contracts out-of-hand. The Legislature was well aware of the fact that customer choice existed when it passed HB6 and was well aware of the extent to which customer choice as a concept is incompatible with the notion of long-term contacts. It is not Delmarva prerogative to simply brush aside the Legislature.

In addition, the actual fact of customer choice as a concern appears more imagined than real. Indeed, less than one percent of Delmarva's customers switched to another provider even in the face of 60 percent price increase, and the rate at which Delmarva customers are switching to other providers appears to have lessened significantly. Moreover, over the same time period

that Delmarva has lost customers to other providers, Delmarva's customer class has grown. Further, given projections that the number of Delaware households is projected to grow by more than 90,000 between 2005 and 2030, http://www.state.de.us/planning/information/dpc/DPC2006v0.pdf, Delmarva may well have the opposite problem—an expanding customer base. Further, as Willett Kempton and I noted in our RFP evaluation report comments, our scientific survey of Delaware residents (which includes approximately 600 Delmarva customers) suggests if anything, that in the long-term "wind power will not only help Delmarva retain its present customer base, but to draw in additional customers as well."

Second, the Legislature was likewise aware of the possibility of stranded costs, another expressed Delmarva concern. Delmarva's statement that: "The best way for Delmarva to avoid exposing its customers to stranded costs, and mitigate the price volatility risk posed by migration, is to avoid long term commitments and limit the term length of energy supply commitments as is effected by Delmarva's current energy procurement process" (Draft IRP, p. 9), suggests that Delmarva is uninterested or unwilling to implement the legislative mandate. Finally, while Delmarva trumpets the present system of procurement, that system was implemented before HB6 (see e.g., PSC Order 6881, entered 28 March 2006) and thus cannot in itself serve to defeat the desire of the Legislature for Delmarva to undertake long-term supply analysis.

Despite all of the aforementioned facts and understandings before it, the Legislature nonetheless directed Delmarva to immediately take actions in the form of an RFP to stabilize the long-term outlook for consumer rates. Perhaps the Legislature was mistaken. Perhaps the Legislature astutely understood that consumers are more concerned with long-term price stability than they are with short-term price increases. This is no matter as far as the IRP is concerned.

What is of concern is Delmarva's total failure to consider in a serious and detailed way the benefits and risks of entering into a long-term contact.

In sum, while Delmarva acknowledges that the "IRP becomes, in reality, a balance between providing low cost electricity and mitigating price fluctuations for SOS customers," it fails to seriously consider the main mechanism that the Legislature directed it to consider to mitigate long-term price fluctuations—entering into a long-term contract pursuant to the RFP.

3. Delmarva Should Implement all Cost-effective Energy Efficiency Measures

The overall approach of this document was to subcontract with a consulting firm to analyze a large set of energy efficiency and load reduction strategies. One result is a list of conservation measures that can be ranked by cost per kWh of saved energy and by cost per kW of saved peak load. This is generally a good approach by which to compare conservation or efficiency measures. For an initial test, Total Resource Costs (TRC) was used rather than Rate Impact Test (RIM) or the Participant Cost Test (PCT), which is consistent with good practice.

The implementation approach assumes voluntary adoption programs, whereas an alternative might be that some measures identified in Delmarva Power's analysis would be more effectively addressed by legislation, e.g., energy efficient building codes or appliance standards. Candidates might be, for example, measures that have low cost and large aggregate effect, but which will be slow to enter the market. Of course, Delmarva Power cannot pass legislation (and thus could not assure those conservation savings in this document), but it would be able to draw on its analysis to suggest such action to state or county governments. As another example, there may be some measures that are so cost effective that they could just be installed in all houses willing to take them, as was done, for example, by a utility in Santa Monica, CA. More

generally, there is not very much discussion of implementation alternatives for the measures identified.

In addition, the spending for a 'general awareness campaign' would better be spent on the direct conservation programs. This type of general awareness and publicity has been shown to be less effective that specific advice or assistance

I support all cost-effective energy efficiency efforts; Delmarva should have been significantly more aggressive in that regard. Support of energy efficiency is entirely compatible with the view expressed earlier that Delmarva seriously consider long-term contracts in the IRP. Long-term contracts for new supply that are not tied to future fuel prices can provide substantial benefits in terms of long-term price stability and assurance of supply. While energy efficiency, like new supply, will affect prices on the margin (it will decrease demand, whereas new supply increases supply), energy efficiency in isolation will not provide the same amount of long-term price stability as new supply.

B. Specific Comments

1. **Price Stability**. On page 9, Delmarva states that: "Delmarva's view is that 'price stability' does not mean that prices never change; but that over time the percentage changes (up or down) tend to be as small as they can ***given energy market conditions***" (emphasis added). The highlighted provision renders price stability meaningless and suggests that Delmarva fails to appreciate that actions such as entering into long-term contacts can dampen price changes irrespective of what happens in the market. It again suggests that Delmarva came into this IRP with an agenda rather than taking an objective view.

Delmarva goes on to note that: "Most price volatility has been in the PJM energy markets and the closely related Delmarva SOS requirements market. This has been predominantly due to volatility in natural gas and oil prices." IRP P. 14. It also states that: "The principal cause of these rising natural gas prices has been increasing demand for the two premium fossil fuels: oil and natural gas. Oil competes closely with natural gas in the United States and internationally. There is a very strong correlation between oil and gas prices year by-year." IRP Supporting Document, p. 59. Despite these concerns, Delmarva gives scant, if any consideration, to the one action that could most alleviate consumers from the burdens of unstable gas prices—entering into a long-term contract.

2. **Costs of CO_2:** Delmarva uses an unrealistically low price of carbon: $6/ton in 2013, $18/ton in 2020, and $26/ton in 2025. See IRP at 30 and IRP Support Doc. at 49. In the RFP evaluation, Delmarva used a levelized price of $12.1/ton. As Willett Kempton and I noted in our preliminary RFP evaluation comments:

> The State Consultant's report suggests that CO_2 cost estimates used by it and Delmarva are low, and suggests that more appropriate estimates may be found in a report by an economic consulting firm, Synapse Energy Economics (State Consultant report, at footnote 32).[1] Given that the State has recently selected Synapse to assist it with the Integrated Resource Plan (IRP) analysis, we redo the analysis with the Synapse numbers. The middle estimate of Synapse is $19.6/ton, while the high estimate is $30.8/ton.
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> Because an offshore wind power project would not emit any CO_2 during operation, BWW's bids look increasingly attractive when the Synapse analysis is employed, as the market price increases between $5 and $17/MWh depending on whether the middle or high CO_2 price is used and whether the Delaware (which is higher) or the U.S, average CO_2 emissions/MWh are employed. But what we can say is that with the Synapse carbon forecasts, the Bluewater bid prices would be within the range of raising rates on average 2 percent per year or decreasing them by 1 per cent per year over the 25 year life of the project.

[1] http://www.synapse-energy.com/Downloads/SynapsePaper.2006-06.Climate-Change-and-Power.pdf.

Also see where they used a carbon tax of $10/ton in 2010, rising to $30/ton in 2018. Michigan's 21st Century Energy Plan, Appendix, II, Section 5.4.1., http://www.dleg.state.mi.us/mpsc/electric/capacity/energyplan/index.htm. As Delmarva noted it is "apparent to anyone who deals with such models, the output of the model is determined by the assumptions that are fed into it." IRP p. 28, footnote 1.

3. **Marginal effects of long-term contracts**. Delmarva failed to consider marginal effects of entering into a long-term contract for new power on market prices. As Willett Kempton and I noted in our preliminary RFP evaluation comments:

> Any economic evaluation also should consider that a new large power facility will reduce locational marginal pricing, with financial benefits to customers. The hourly market bidding process means that adding a new block of power in Delaware will obviate the need for some power that is now bid at the highest price and used. Thus, any of these bids will lower market prices of electricity for all customers in the region, including SOS customers. For similar reasons, both the coal and wind bids would lower natural gases prices on the margin, whereas the Conectiv bid would create new demand for natural gas and raise gas prices. These are important effects, especially on the market clearing price of electricity, and are not considered by either consultant. Thus all aggregate cost estimates, especially for the coal and wind bids, are too high.

4. **Delmarva assumes a static RPS.** Delmarva analyzes the IRP as if the RPS is necessarily set for ever. As Minnesota electricity providers know that is not necessarily the case. Minnesota had imposed a good faith requirement to procure 10% renewables by 2015. However, in February 2007, it enacted a 25% requirement by 2025. Delmarva should model these types of changes in Delaware as well.

5. **Delmarva misconstrues the requirement for fuel diversity.** HB6 provides that Delmarva consider the "economic and environmental value of … Resources that promote fuel diversity." Delmarva interprets this directive as follows: "diversity can relate to differing lengths of supply commitments, the development of transmission, DSM and other energy efficiency

measures or other resource options." Report p. 9. However, the Legislature spoke of fuel diversity. That the Legislature would wish Delmarva to promote fuel diversity is not surprising given that Delmarva relies on fossil fuels and nuclear power for more than 98% of the supply, while only 0.1% comes from solar and wind combined. A pattern of over-reliance on natural gas is highlighted when one considers recent developments in PJM, where, "natural gas fuels about 99.4 percent of the 26 GW of capacity additions that have come online since 1999." IRP Support Document, p. 58.

Delmarva further contorts the meaning of fuel diversity when it uses the policy in favor of fuel diversity as a means to avoid having to seriously consider long-term contracts. It states that: "Relying on a contract from a large single source generating facility reduces diversity…." Report, p. 24. Given that one of the bidders proposed, offshore wind power, Delmarva must do more in its consideration and weighing the benefits of true fuel diversity.

6. **Delmarva's IRP fails to account for customers' wants and needs.** Delmarva states that it "believes that the SOS procurement process should … [a]llow Delmarva to purchase the electricity supply product(s) best suited to customer needs." IRP at 22. Willett Kempton and I noted in our preliminary RFP evaluation comments that:

> A University of Delaware survey was made of the state power preferences, by the authors of this document and by a Ph.D. student, Andrew Krueger. (http://www.ocean.udel.edu/windpower/docs/DE-survey-InterimReport-16Jan2007.pdf). The survey was designed and conducted before the RFP process, so it does not exactly match the choices among these bids.
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> Survey respondents were asked to choose among power options that included two offshore wind proposals with varying degrees of visual impact and varying prices versus additional power from natural gas or coal[2] power at no change in price and no ocean view impact. They were asked to make this comparison three times,

[2] We asked about an unspecified coal generator, not a coal gasification generator that might capture and sequester up to 65% of the carbon, so the comparison is imperfect but arguably, not very different from natural gas.

each time with different wind power attributes. As reported previously, when we combine all the wind options that cost between $1-30 more per month for the first three years, 91% preferred one of the offshore wind options rather than electricity from coal or natural gas.

We have in this report more precisely separated out Delmarva customers (599 of the 931 respondents who identified an electric provider, and looked in more detail at the simplest comparison where only (a) the initial price (the same as the coal or natural gas option or $1-30 more per month for the first three years); (b) the distance from shore varied between the two wind power options; and (c) both wind power options were in the ocean off the southern part of Delaware. We then considered only those options, where the price of one wind option was either $10 or $20 per month and the other $20 or $30 per month (227 Delmarva Power respondents received one of these options). Even at these higher prices ($10-$30/month), 89 percent favor a wind option to coal or natural gas, with the selected wind option averaging approximately 7 miles from shore. This suggests that the public would be supportive of a slight increase in electricity rates to support the adoption of a wind power project.

Table 6. Delmarva Customers' Energy Source Preferences

	Same price for one wind option	**$10 - $30 more for wind**	**$20 - $30 more for wind**
Prefer coal or gas	5%	11%	15.5
Prefer wind	95%	89%	84.5

The study also debunks the general notion that "everything else being equal, the longer the term of a procurement contract, the greater the risk of SOS customer migration" (IRP Report, p. 21) at least as far as that general notion is applied to offshore wind power.

7. **Delmarva incorrectly assumes that new plants will be large.** In its rejection of long-term contracts, Delmarva appears to have assumed that (a) such plants would be in the range of 500-600 MW and would be (b) fossil fuel plants. As such, "matching a resource to the load is difficult since, on the one hand, the economies of scale in supply support a larger resource commitment relative to the load while, on the other hand, large commitments increase risk by decreasing diversity." As is now apparent from the bids, Delmarva's assumptions are not correct. Conectiv proposed a 177 MW natural gas project; NRG proposed to sell Delmarva 400MW

(with the option to Delmarva to dampen-down the load to 280 MW) of load, while Bluewater Wind, given the capacity factor for offshore wind, proposed to deliver on average between 130 and 180MW.

8. **Load and SOS growth.** Delmarva estimates that peak SOS demand will grow at a rate of 2.1% per year between now and 2016, necessitating an additional 191 MW of electricity at peak demand. Also of note is PJM's recent statement that it has had both winter and summer peaks in the last year and that "during the next 10 years, the highest demand for electricity use is expected to grow by 22,861 MW." PJM's January 2007 Load Forecast Report. The Load Growth suggests that new supply needs to be added to the system overall, and that to ensure that Delmarva customers have adequate supply and as a hedge against future price increases, Delmarva needs to seriously evaluate long-term supply options.

9. **Accuracy of natural gas price.** Delmarva states that "in 2005, Henry Hub Louisiana gas prices, the principal marker price for U.S. natural gas, reached $8.37/MMBtu versus a ten year average of $3.42/MMBtu. In every year since 2000, natural gas prices have been higher than the highest price in the 1990s." IRP Support Document, p. 59. Yet, Delmarva relies to the potential detriment of residential customers on flat natural gas prices going out until 2020. While consumers tend to think of the last few years as being subject to unprecedented natural gas price increases, in actuality, wellhead natural gas prices went up by more in both nominal and real terms between 1996 and 2001 then they did between 2001 and 2006. See http://www.eia.doe.gov/oil_gas/natural_gas/info_glance/natural_gas.html. These increases resulted in an almost tripling of the nominal price and a real increase of 118% in wellhead prices from 1996 to 2006. As further proof of the volatility of natural gas prices and the risk of the

assumptions employed by Delmarva, since January 3, 2007, natural gas prices have risen 33% to $7.345/MMBtu (at one point spiking as high as $9.00/MMBTU).

Thus, we have seen a fairly consistent recent trend of increasing natural gas prices for at least the past 10 years. This trend occurred notwithstanding the price spike that occurred in the wake of Hurricane Katrina. Given that Delmarva relies on natural gas that "originates primarily from sources in the Gulf of Mexico" (IRP Support Document, p.62) and that the Intergovernmental Panel on Climate Change (IPCC) in its recent 4th Assessment concluded the hurricanes are likely to grow stronger with larger peak wind speeds and have more heavy precipitation associated with them (http://www.ipcc.ch/SPM2feb07.pdf, p. 16) and Delmarva's models are premised on "normal weather," Delmarva's assumptions put residential ratepayers at substantial risk.

10. **Delmarva incorrectly places future wind power development onshore rather than at sea.** Delmarva states that the base case indicates that by 2016, an additional 125 MW of generation from renewable resources (particularly on-shore wind) should be built in Delaware." IRP, p. 30. While I agree with Delmarva the wind generation is needed, far more than 125 MW of new generation should be built and it should be offshore, rather than onshore. One of the fallacies of the Delmarva IRP is that small amounts of wind power (< 50MW for residential customers) should be deployed. What Delmarva does not account for is that there are significant economies of scale that are realized with larger wind farms. Indeed, the price Delmarva SOS customers would have to pay to purchase wind power from the small facility contemplated by Delmarva could be double or triple the cost/kWh of the just under 10 cents/kWh the Bluewater wind project was bid at.

Delmarva also displays that it has little understanding of wind regimes in Delaware and off its coast. Other than at Cape Henlopen, there are probably no onshore wind resources that are commercially viable in Delaware. See http://www.awstruewind.com/inner/windmaps/maps/NorthAmerica/UnitedStates/Delaware/DE_SPD70m.pdf. On the other hand, as documented by Kempton, et al. (2007), http://www.ocean.udel.edu/windpower/, the wind resources off Delaware and the whole mid-Atlantic bight are of utility-grade and are abundant.

11. **Please Clarify.**

A. In Table 2**,** I ask Delmarva to clarify the average MWh used by each class of service as part of total SOS load.

B. In the entries for "SmartStat", is this simply the programmed thermostat, or is it a thermostat that can be remotely adjusted a couple of degrees to provide load shedding? If the former, the EPA Energy Star program is finding that programmable thermostats are not, in practice, saving energy. If the latter, this is a good idea to include in the mix, and appears to be cost effective.

Respectfully submitted,

Jeremy Firestone
7 March 2007